DEVELOPMENT, EMERGENCE, AND MORTALITY OF CHINOOK SALMON FRY (Oncorhynchus tshawytscha) IN A NATURAL REDD ON THE LEMHI RIVER IDAHO

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Abstract

Incubation of chinook salmon eggs under natural conditions in 1957 on the Lemhi River took approximately 12 weeks, from September 1 to December 1. Emergence begins as soon as the yolk sack is absorbed, and the first emergents were collected on February 15, 1958. Emergence from the redd continued for a period of 18 days. Seventy-three per cent of the total eggs laid hatched, and 42.3 per cent of the total eggs laid emerged as fry.

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During the spawning season in late August, 1957, a salmon redd was located and marked in the Lemhi River near the town of Leadore, Idaho. The peak of spawning activity occurred around September 1st. Several adult females spawned on the same riffle, and some overlapping of redds may have taken place.

Incubation of eggs

A small section of the gravel was dug up from the spawning riffle on December 12, 1957, and 34 sack fry were collected. Nine of the fry collected were dead. Water temperature at midday was 38º F. Time of hatching was estimated to have been about the first of December, making an incubation period of 12 weeks.

Development and emergence

On January 21, 1958, a specially designed trap was placed over the redd to collect fry when they emerged from the gravel. Sack fry which were dug up from the gravel at this time showed considerable development of fins, pigmentation, and absorption of the yolk sack, Although they had not increased in length (35 millimeters). Weekly

checks were made at the trap, and the first emergents were collected on February 15, about 10 weeks after hatching. Emergence continued over a period of 18 days until March 4 (Table 1).

TABLE 1.—Date of chinook salmon fry emergence from a natural redd on the Lemhi River, 1958

Trap checked	Number of fry	Water temp. F.
Jan 21	(installed)	37º
Jan 30	0	37º
Feb 8	0	36º
Feb 15	4	38º
Feb 19	88	37º
Feb 23	37	43º
Feb 28	70	37º
Mar 4	13	40º
Mar 9	0	37º
Mar 17	1	40º
	213	

Mortality

Since virtually no emergence occurred for a period of 13 days after March 4, it was assumed that emergence had ceased. On March 17 the gravel beneath the trap, an area four feet square, was dug up. A total of 104 live fry (yolk sack absorbed), 46 dead fry (yolk sack absorbed), 5 dead sack fry, and 136 dead eggs were collected. The live fry which were still in the gravel appeared to be thinner and have less vitality than those which had emerged. It was assumed that these would not have emerged because of their weakened condition. Using this premise, the per cents of spawning success and fry emergence are presented in Table 2.

TABLE 2.—Per cents of spawning success and fry emergence from a chinook salmon redd in the Lemhi River, 1958

Total eggs laid	Total eggs hatched	Per cent eggs hatched	Total fry emerged	Per cent fry emerged
504	367	72.8*	213	42.3*

* Per cent of total eggs laid (504)